

We claim:

1. A method of operating a data communication apparatus comprising:

at each of a plurality of service specific transceivers:

receiving a plurality of input signals from a given plurality of data communications devices operating with a given data communication protocol;

aggregating each of said received plurality of input signals to result in a given service specific electrical signal;

transmitting said given service specific electrical signal to a wavelength access controller;

at said wavelength access controller:

receiving a plurality of service specific electrical signals from a plurality of service specific transceivers, at least two of said service specific transceivers operating with different data communication protocols;

converting said plurality of service specific electrical signals to a corresponding plurality of service specific optical signals;

wavelength division multiplexing said plurality of service specific optical signals to result in a wavelength division multiplexed signal; and

transmitting said wavelength division multiplexed signal over an optical conductor to an element of an optical transport network.

2. The method of claim 1 further comprising, at said wavelength access controller, classifying each of said plurality of service specific electrical signals.

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1 3. The method of claim 1 further comprising maintaining, at said wavelength access  
2 controller, a database of information relating to resources in said optical transport network.

1 4. The method of claim 2 wherein said resources comprise wavelength channels between  
2 elements in said optical transport network.

1 5. The method of claim 3 further comprising

2 receiving a connection request from one of said plurality of service specific  
3 transceivers;

4 determining, based on said information in said database, a path through said transport  
5 network corresponding to said connection request; and

6 instructing said element of said optical transport network to set up said determined  
7 path through said transport network..

1 6. The method of claim 1 further comprising, before said converting, including header  
2 information in each of said plurality of service specific electrical signals.

1 7. Data communication apparatus, comprising:

2 a first transceiver for:

3 receiving a plurality of input signals from a first plurality of data  
4 communications devices operating with a first data communication protocol;

5 aggregating each of said received plurality of input signals to result in a first  
6 service specific electrical signal;

7 transmitting said first service specific electrical signal to a wavelength access  
8 controller;

9 a wavelength access controller for:

10 receiving a plurality of service specific electrical signals from a plurality of  
11 service specific transceivers, at least two of said service specific transceivers  
12 operating with different data communication protocols;

13 converting said plurality of service specific electrical signals to a  
14 corresponding plurality of service specific optical signals;  
15 wavelength division multiplexing said plurality of service specific optical  
16 signals to result in a wavelength division multiplexed signal; and  
17 transmitting said wavelength division multiplexed signal over an optical  
18 conductor to an element of an optical transport network.

1 8. Data communication apparatus, comprising:

2 a first transceiver comprising:

3 means for receiving a plurality of input signals from a first plurality of data  
4 communications devices operating with a first data communication protocol;  
5 means for aggregating each of said received plurality of input signals to result  
6 in a first service specific electrical signal;  
7 means for transmitting said first service specific electrical signal to a  
8 wavelength access controller;

9 a wavelength access controller comprising:

10 means for receiving a plurality of service specific electrical signals from a  
11 plurality of service specific transceivers, at least two of said service specific  
12 transceivers operating with different data communication protocols;  
13 means for converting said plurality of service specific electrical signals to a  
14 corresponding plurality of service specific optical signals;  
15 means for wavelength division multiplexing said plurality of service specific  
16 optical signals to result in a wavelength division multiplexed signal; and  
17 means for transmitting said wavelength division multiplexed signal over an  
18 optical conductor to an element of an optical transport network.

1 9. A computer readable medium for providing program control for a wavelength access  
2 controller in a wavelength access server, where said wavelength access server is  
3 communicatively coupled to both a plurality of service specific data communications devices  
4 and an element of an optical transport network, and said wavelength access controller is  
5 communicatively coupled to a plurality of service specific transceivers, said computer  
6 readable medium adapting said wavelength access controller to be operable to:

7 classify a service specific electrical signal from each of said plurality of service  
8 specific transceivers;

9 maintain a database of information relating to resources in said optical transport  
10 network;

11 receive a connection request, from one of said plurality of service specific  
12 transceivers, for a path through said transport network;

13 determine, based on said information in said database, a path through said transport  
14 network corresponding to said connection request; and

15 signal said element of said optical transport network to set up said determined path  
16 through said transport network.

1 10. A method of operating a data communication apparatus comprising:

2 at a wavelength access controller:

3 receiving a wavelength division multiplexed signal over an optical conductor  
4 from an element of an optical transport network;

5 wavelength division de-multiplexing said wavelength division multiplexed  
6 signal to result in a plurality of service specific optical signals;

7 converting said plurality of service specific optical signals to a corresponding  
8 plurality of service specific electrical signals;

9 determining which of a plurality of service specific transceivers correspond to  
10 each of said plurality of service specific electrical signals;

11 transmitting each of said plurality of service specific electrical signals to a  
12 determined corresponding service specific transceiver;  
13 at each of said plurality of service specific transceivers:  
14 receiving a given service specific electrical signal from said wavelength access  
15 controller;  
16 segmenting said given service specific electrical signal to result in a plurality  
17 of output signals; and  
18 transmitting each of said plurality of output signals to a corresponding data  
19 communications device.

1 11. A data communication apparatus comprising:

2 a wavelength access controller comprising:

3 means for receiving a wavelength division multiplexed signal over an optical  
4 conductor from an element of an optical transport network;

5 means for wavelength division de-multiplexing said wavelength division  
6 multiplexed signal to result in a plurality of service specific optical signals;

7 means for converting said plurality of service specific optical signals to a  
8 corresponding plurality of service specific electrical signals;

9 means for determining which of a plurality of service specific transceivers  
10 correspond to each of said plurality of service specific electrical signals;

11 means for transmitting each of said plurality of service specific electrical  
12 signals to a determined corresponding service specific transceiver;

13 at each of said plurality of service specific transceivers:

14 means for receiving a given service specific electrical signal from said  
15 wavelength access controller;

16 means for segmenting said given service specific electrical signal to result in a  
17 plurality of output signals; and

18 means for transmitting each of said plurality of output signals to a  
19 corresponding data communications device.

1 12. A data communication apparatus comprising:

2 a wavelength access controller for:

3 receiving a wavelength division multiplexed signal over an optical conductor  
4 from an element of an optical transport network;

5 wavelength division de-multiplexing said wavelength division multiplexed  
6 signal to result in a plurality of service specific optical signals;

7 converting said plurality of service specific optical signals to a corresponding  
8 plurality of service specific electrical signals;

9 determining which of a plurality of service specific transceivers correspond to  
10 each of said plurality of service specific electrical signals;

11 transmitting each of said plurality of service specific electrical signals to a  
12 determined corresponding service specific transceiver;

13 a service specific transceiver for:

14 receiving a given service specific electrical signal from said wavelength access  
15 controller;

16 segmenting said given service specific electrical signal to result in a plurality  
17 of output signals; and

18 transmitting each of said plurality of output signals to a corresponding data  
19 communications device.

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